

New Graph

[2, 1, 5, 5, 1], [4, 3, 4, 3, 2]

$$\pi = [1, 1, 1, 1, 1]$$

POSSIBLE RANKS

1 x 5

BASE DETERMINANT 725/4096, .1770019531

NullSpace of Δ

{1, 2, 3, 4, 5}

Nullspace of A

$$= \frac{\det(A)}{1/16}$$

1 . Coloring, {}

R: [2, 1, 5, 5, 1]

B: [4, 3, 4, 3, 2]

[See graph](#)

[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 4	5 vs 5	5 vs 5	3 vs 3	3 vs 3

Omega Rank for R : cycles: {{1, 2}} order: 2

[See Matrix](#)

$$[y_1, y_2, 0, 0, y_3]$$

Omega Rank for B : cycles: {{3, 4}} order: 2

[See Matrix](#)

$$[0, y_1, y_2, y_3, 0]$$

2 . Coloring, {2}

R: [2, 3, 5, 5, 1]

B: [4, 1, 4, 3, 2]

[See graph](#)

[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 4	5 vs 5	5 vs 5	4 vs 4	4 vs 4

Omega Rank for R : cycles: $\{\{1, 2, 3, 5\}\}$ order: 4

[See Matrix](#)

$$[y_2, y_3, y_1, 0, y_4]$$

Omega Rank for B : cycles: $\{\{3, 4\}\}$ order: 4

[See Matrix](#)

$$[y_4, y_1, y_2, y_3, 0]$$

3 . Coloring, {3}

R: [2, 1, 4, 5, 1]

B: [4, 3, 5, 3, 2]

[See graph](#)

[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 4	5 vs 5	5 vs 5	4 vs 4	4 vs 4

Omega Rank for R : cycles: $\{\{1, 2\}\}$ order: 4

[See Matrix](#)

$$[y_4, y_3, 0, y_1, y_2]$$

Omega Rank for B : cycles: $\{\{2, 3, 5\}\}$ order: 3

[See Matrix](#)

$$[0, y_1, y_2, y_3, y_4]$$

4 . Coloring, {4}

R: [2, 1, 5, 3, 1]**B:** [4, 3, 4, 5, 2][See graph](#)[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 4	5 vs 5	5 vs 5	4 vs 4	4 vs 4

Omega Rank for R : cycles: $\{\{1, 2\}\}$ order: 4[See Matrix](#) $[y_3, y_4, y_2, 0, y_1]$ Omega Rank for B : cycles: $\{\{2, 3, 4, 5\}\}$ order: 4[See Matrix](#) $[0, y_1, y_2, y_3, y_4]$

5 . Coloring, {5}

R: [2, 1, 5, 5, 2]**B:** [4, 3, 4, 3, 1][See graph](#)[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 4	5 vs 5	5 vs 5	3 vs 3	3 vs 3

Omega Rank for R : cycles: $\{\{1, 2\}\}$ order: 2[See Matrix](#) $[y_1, y_2, 0, 0, y_3]$ Omega Rank for B : cycles: $\{\{3, 4\}\}$ order: 2[See Matrix](#) $[y_1, 0, y_2, y_3, 0]$

6 . Coloring, {2, 3}

$$\Omega p(\Delta)=0: \quad p' = s \quad p' = s^2 \quad p' = s^3 \quad p = s$$

R: [2, 3, 4, 5, 1]

B: [4, 1, 5, 3, 2]

[See graph](#)

[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
0 vs 4	1 vs 5	1 vs 5	1 vs 5	1 vs 5

Omega Rank for R : cycles: {{1, 2, 3, 4, 5}} order: 5

[See Matrix](#)

$$[y_1, y_1, y_1, y_1, y_1]$$

$$p' = -1 + s \quad p' = -1 + s^2 \quad p' = -1 + s^3 \quad p' = -1 + s^4$$

Omega Rank for B : cycles: {{1, 2, 3, 4, 5}} order: 5

[See Matrix](#)

$$[y_1, y_1, y_1, y_1, y_1]$$

$$p' = -s + s^3 \quad p' = 1 - s \quad p' = -s + s^4 \quad p' = -s + s^2$$

[See 5-level graph](#)

	M	N
	0 1 1 1 1	0 1 1 1 1
	1 0 1 1 1	1 0 1 1 1
	[1 1 0 1 1]	[1 1 0 1 1]
	1 1 1 0 1	1 1 1 0 1
	1 1 1 1 0	1 1 1 1 0

$$\tau = 5, r' = 4/5$$

R: [2, 3, 4, 5, 1]

B: [4, 1, 5, 3, 2]

Ranges

Action of R on ranges, [[1]]

Action of B on ranges, [[1]]

Cycles: R, {{1, 2, 3, 4, 5}}, B, {{1, 2, 3, 4, 5}}

$$\beta(\{1, 2, 3, 4, 5\}) = 1/1$$

Partitions

$$\alpha(\{\{1\}, \{5\}, \{2\}, \{3\}, \{4\}\}) = 1/1$$

$$b1 = \{1\}, b2 = \{5\}, b3 = \{2\}, b4 = \{3\}, b5 = \{4\}$$

Action of R and B on the blocks of the partitions: = [2, 5, 1, 3, 4] [3, 4, 2, 5, 1]
with invariant measure [1, 1, 1, 1, 1]

N by blocks, check: true . [See partition graph.](#)

[See level-5 partition graph.](#)

Right Group	
Coloring	{2, 3}
Rank	5
R,B	[2, 3, 4, 5, 1], [4, 1, 5, 3, 2]
Π_2	[1, 1, 1, 1, 1, 1, 1, 1, 1, 1]
u_2	[1, 1, 1, 1, 1, 1, 1, 1, 1, 1] (dim 1)
wpp	[1, 1, 1, 1, 1]
Π_5	[1]
u_5	[1]

7 . Coloring, {2, 4}

R: [2, 3, 5, 3, 1]

B: [4, 1, 4, 5, 2]

[See graph](#)

[See pair graph](#)

Δ -Rank	A+(1/2) Δ	A-(1/2) Δ	R	B
4 vs 4	5 vs 5	5 vs 5	4 vs 4	4 vs 4

Omega Rank for R : cycles: {{1, 2, 3, 5}} order: 4

[See Matrix](#)

$$[y_2, y_1, y_3, 0, y_4]$$

Omega Rank for B : cycles: $\{\{1, 2, 4, 5\}\}$ order: 4

[See Matrix](#)

$$[y_1, y_2, 0, y_3, y_4]$$

8 . Coloring, $\{2, 5\}$

R: [2, 3, 5, 5, 2]

B: [4, 1, 4, 3, 1]

[See graph](#)

[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 4	5 vs 5	5 vs 5	3 vs 3	3 vs 3

Omega Rank for R : cycles: $\{\{2, 3, 5\}\}$ order: 3

[See Matrix](#)

$$[0, y_1, y_2, 0, y_3]$$

Omega Rank for B : cycles: $\{\{3, 4\}\}$ order: 2

[See Matrix](#)

$$[y_1, 0, y_2, y_3, 0]$$

9 . Coloring, $\{3, 4\}$

R: [2, 1, 4, 3, 1]

B: [4, 3, 5, 5, 2]

[See graph](#)

[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 4	5 vs 5	5 vs 5	2 vs 4	4 vs 4

Omega Rank for R : cycles: $\{\{1, 2\}, \{3, 4\}\}$ order: 2

[See Matrix](#)

$$[-y_2 + 3y_1, y_2, y_1, y_1, 0]$$

$$p' = s - s^3 \quad p = s - s^3$$

Omega Rank for B : cycles: {{2, 3, 5}} order: 3

[See Matrix](#)

$$[0, y_2, y_1, y_3, y_4]$$

10 . Coloring, {3, 5}

R: [2, 1, 4, 5, 2]

B: [4, 3, 5, 3, 1]

[See graph](#)

[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 4	5 vs 5	5 vs 5	4 vs 4	4 vs 4

Omega Rank for R : cycles: {{1, 2}} order: 4

[See Matrix](#)

$$[y_2, y_1, 0, y_3, y_4]$$

Omega Rank for B : cycles: {{1, 3, 4, 5}} order: 4

[See Matrix](#)

$$[y_3, 0, y_1, y_2, y_4]$$

11 . Coloring, {4, 5}

R: [2, 1, 5, 3, 2]

B: [4, 3, 4, 5, 1]

[See graph](#)

[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 4	5 vs 5	5 vs 5	4 vs 4	4 vs 4

Omega Rank for R : cycles: {{1, 2}} order: 4

[See Matrix](#)

$$[y_3, y_1, y_2, 0, y_4]$$

Omega Rank for B : cycles: {{1, 4, 5}} order: 3

[See Matrix](#)

$$[y_4, 0, y_1, y_2, y_3]$$

12 . Coloring, {2, 3, 4}

R: [2, 3, 4, 3, 1]

B: [4, 1, 5, 5, 2]

[See graph](#)

[See pair graph](#)

Δ -Rank	A+(1/2) Δ	A-(1/2) Δ	R	B
4 vs 4	5 vs 5	5 vs 5	4 vs 4	4 vs 4

Omega Rank for R : cycles: {{3, 4}} order: 4

[See Matrix](#)

$$[y_4, y_3, y_1, y_2, 0]$$

Omega Rank for B : cycles: {{1, 2, 4, 5}} order: 4

[See Matrix](#)

$$[y_1, y_2, 0, y_3, y_4]$$

13 . Coloring, {2, 3, 5}

R: [2, 3, 4, 5, 2]

B: [4, 1, 5, 3, 1]

[See graph](#)

[See pair graph](#)

Δ -Rank	A+(1/2) Δ	A-(1/2) Δ	R	B
4 vs 4	5 vs 5	5 vs 5	4 vs 4	4 vs 4

Omega Rank for R : cycles: {{2, 3, 4, 5}} order: 4

[See Matrix](#)

$$[0, y_1, y_2, y_4, y_3]$$

Omega Rank for B : cycles: {{1, 3, 4, 5}} order: 4

[See Matrix](#)

$$[y_1, 0, y_2, y_3, y_4]$$

14 . Coloring, {2, 4, 5}

R: [2, 3, 5, 3, 2]

B: [4, 1, 4, 5, 1]

[See graph](#)

[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 4	5 vs 5	5 vs 5	3 vs 3	3 vs 3

Omega Rank for R : cycles: {{2, 3, 5}} order: 3

[See Matrix](#)

$$[0, y_1, y_3, 0, y_2]$$

Omega Rank for B : cycles: {{1, 4, 5}} order: 3

[See Matrix](#)

$$[y_1, 0, 0, y_3, y_2]$$

15 . Coloring, {3, 4, 5}

R: [2, 1, 4, 3, 2]

B: [4, 3, 5, 5, 1]

[See graph](#)

[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B

4 vs 4	5 vs 5	5 vs 5	2 vs 4	4 vs 4
--------	--------	--------	--------	--------

Omega Rank for R : cycles: {{3, 4}, {1, 2}} order: 2

[See Matrix](#)

$$[-y_2 + 3y_1, y_2, y_1, y_1, 0]$$

$$p = -s + s^3 \quad p' = -s + s^3$$

Omega Rank for B : cycles: {{1, 4, 5}} order: 3

[See Matrix](#)

$$[y_3, 0, y_4, y_1, y_2]$$

16 . Coloring, {2, 3, 4, 5}

R: [2, 3, 4, 3, 2]

B: [4, 1, 5, 5, 1]

[See graph](#)

[See pair graph](#)

Δ -Rank	$A+(1/2)\Delta$	$A-(1/2)\Delta$	R	B
4 vs 4	5 vs 5	5 vs 5	3 vs 3	3 vs 3

Omega Rank for R : cycles: {{3, 4}} order: 2

[See Matrix](#)

$$[0, y_3, y_2, y_1, 0]$$

Omega Rank for B : cycles: {{1, 4, 5}} order: 3

[See Matrix](#)

$$[y_1, 0, 0, y_2, y_3]$$

SUMMARY	
Graph Type	NOT CC
$\nu(A)$	0

$\nu(\Delta)$	1
π	[1, 1, 1, 1, 1]
Dbly Stoch	true

SANDWICH		Total 0
No .	Coloring	Rank

RT GROUPS		Total 1	
No .	Coloring	Rank	Solv
1	{2, 3}	5	["group", Not Solvable]

Δ -RANK'D	SC'D !RK'D	τ -RANK'D	R/B RANK'D	NOT SYNC'D	Total Runs	2^{n-1}
15	0	15 , 15	13 , 15	1	16	16
